White paper and colourful language: Toward a realistic view of animal research

Grimm, Herwig ; Eggel, Matthias

DOI: https://doi.org/10.1177/026119291704500207

Comment

White Paper and Colourful Language: Toward a Realistic View of Animal Research

Herwig Grimm[a] and Matthias Eggel[a]

Ostensibly high scientific standards and the promise of short-term benefits are significant challenges for animal research

The Max-Planck Society (MPS) recently published a mission statement as its White Paper on animal research.[1] In this mission statement, they affirm the value and importance of scientific inquiry for the well-being and survival of mankind, and stress the long-term usefulness of the advancement of knowledge, in that it generates potential preconditions for future problem solving. Beyond well-being and survival, the MPS attributes an intrinsic value to "the attempt to improve understanding of the world" — for example, by gaining insight through basic research — and adds that this search for knowledge is constitutive of human culture. At the same time, the authors of the White Paper acknowledge both the importance of animal welfare in research and the difficulty of weighing potential and intangible benefits against harm inflicted on animals. The MPS explains that the privilege of performing experiments on animals comes with a responsibility to strive for the highest quality of scientific practice, so as to maximise epistemic benefit and ensure the highest possible standards of animal welfare.[1] This MPS White Paper is currently being very intensively debated throughout the German-speaking world — hence the 'colourful language' alluded to in our article title.

The legal stipulations regarding the protection of animals used for scientific purposes are set out in *Directive 2010/63/EU*[2], which regulates the scientific use of non-human vertebrates and cephalopod molluscs in the European Union. Every Member State must amend its legislation, where necessary, to comply with and put into action all aspects of the Directive. The privilege of using animals in research can only be granted, if the criteria specified are met — for instance, research involving animals has to comply with the Three Rs principles of Russell and Burch[3] (*Refinement*, *Reduction*, *Replacement*), and projects must undergo an evaluation process comprising a Harm–Benefit Analysis that assesses "whether the harm to the animals in terms of suffering, pain and distress is justified by the expected outcome, taking into account ethical considerations and may ultimately benefit human beings, animals or the environment" (Art 38d) prior to approval. The Directive clearly intends that the outcome of the experiments has some translational potential, i.e. that it ultimately benefits human beings, animals or the environment.

Both the Directive and the MPS White Paper articulate strict limitations on animal-based research and acknowledge an impetus to protect animals, along with a need for some harm-justifying benefit; yet, the public perception of animal experiments seems to be growing increasingly negative. We believe that this negative view is provoked by at least two aspects of scientific research, of which the wider public are becoming increasingly aware: Firstly, researchers do not always meet their own ostensibly high scientific standards; and secondly, researchers are overstating the short-term benefits that their animal experiments may promise. These two aspects are discussed further below.

The highest possible scientific standards?

The MPS highlights the responsibility of researchers to guarantee the highest possible scientific standards in research involving animals. However, two recent publications question the scientific rigour of many studies that involve the use of animals.[4,5] Both these papers reported the findings

[a]*Both authors contributed equally to this work.*

of an analysis performed on 1277 research proposals submitted to the Swiss authorities for measures against bias (e.g. allocation concealment, blinding, randomisation, sample size calculation, inclusion/exclusion criteria, primary outcome variable, and statistical analysis plan). The authors determined that, within these research proposals, measures against bias were indicated very infrequently. This finding led them to conclude that "…animal experiments are often licensed based on confidence rather than evidence of scientific rigor, which may compromise scientific validity and induce unnecessary harm to animals caused by inconclusive research."[4]

It is important to note that the non-indication of measures against bias does not necessarily imply that resulting data are in fact biased. It does, however, give cause to wonder whether rigorous scientific standards are being met, and whether scientists are doing everything they can to ensure the highest possible scientific standards. Reports such as these, that highlight deficient scientific standards, not only question the mastery of researchers in their own domain. Given the extent of coverage in national newspapers, such reports are also in a position to jeopardise overall public support for research involving animals. Recalling the MPS White Paper, scientific rigour in animal-based research is more than just a scientific issue — it is also an ethical responsibility, and there is no guarantee that it is being fulfilled.

Promising too much?

The privilege of carrying out experiments on animals is granted on the condition that the outcome ultimately benefits humans, animals or the environment. That the Directive requires research to be justified through benefits represents a paradigmatic shift[6] in European legislation. Researchers are now legally bound to summarise predefined, expected benefits, and to describe them in compulsory non-technical project summaries, which will be made publicly available.

The only way to comply with this requirement is to speculate (more or less plausibly) on a project's potential benefits, at which point researchers may feel compelled to exaggerate the potential outcome of their research in order to increase the likelihood of approval. Downstream failure to then produce these proposed benefits is the kind of shortcoming that could easily lead to increasing public disillusionment over what can be legitimately expected of research involving animals, especially since public support for the use of animals in research is largely founded in the belief that scientific inquiry directly and tangibly benefits society.[7]

We argue that disillusionment over the benefits of science stems from an inherent misunderstanding of science. It should be made more clear to a critical public that good science produces good data first and foremost, whereby social benefit is secondary. A lack of direct social benefit does not indicate bad science in terms of it being evidence of substandard scientific procedures. Rather, it is the case that science is primarily carried out to acquire knowledge, which needs to be acquired as a precondition for more-tangible benefits. The need for a Harm–Benefit Analysis has, however, skewed this perception by giving more weight to the more-tangible, publicly communicable direct benefits that are more comprehensible to non-scientists. Yet, such direct benefits are not the rule, but the exception. The relationship between a research project and social benefit is rarely linear, or direct. While the notion that discoveries are serendipitous in nature draws ample criticism, the MPS stresses the value of scientific inquiry that is not goal-oriented and the importance that the acquisition of knowledge has for "all aspects of public life". The challenge lies in bringing non-scientists to appreciate these as positive aspects of research endeavours. How to accomplish this is, of course, a different matter. For example, information on animal research, such as that on the recently launched *Tierversuche verstehen* website[8] in Germany, could play an active part in this role. In our view, highlighting the contributions of science as a necessary but insufficient means of practical benefit, is of major importance when implementing sustainable communication strategies, which aim toward a realistic view of animal research.

Conclusions

In summary, the MPS emphasises the need for high scientific quality in animal-based research, and stresses the importance of the advancement of basic knowledge as a precondition for future problem solving. However, doubt has recently been cast on whether these high scientific standards are, in fact, being met.[4,5] In addition, public expectations of the tangible benefits of animal-based research, as well as the legal requirements that this type of research has direct benefits for society,[7] are undermining the intrinsic value of knowledge acquisition *per se*.

Inflicting harm on animals will remain an ethical problem as long as animals are being used for scientific purposes. The Directive's ultimate goal to replace all animal experimentation with alternative techniques reflects a desire to move on from the problem as soon as possible. This move, in itself, would reduce the need for the justification of animal-based research, with its concomitant issues of scientific validity and public expectations of research that is massively subsidised with tax funding. However, the two main questions posed

here will still remain: *Are scientific standards being met?* And: *Is research promising too much?*

The ethical pressure on research involving the use of animals only brings to light the realisation that it is the tip of a far more profound iceberg, which unapologetically leads to further points for discussion, such as: *What can we demand of, and expect from, science at all?* And the realisation that: *When science goes public, its problems become public problems, too.*

Corresponding author:
Prof Dr Herwig Grimm
Messerli Research Institute
University of Veterinary Medicine,
Medical University of Vienna
and University of Vienna
Veterinaerplatz 1
1210 Vienna
Austria
E-mail: herwig.grimm@vetmeduni.ac.at

Dr Matthias Eggel
Institute of Biomedical Ethics and History of Medicine
University of Zurich
Winterthurerstrasse 30
8006 Zürich
Switzerland

References

[1] Anon. (2016). *White Paper: Tierversuche in der Max-Planck-Gesellschaft; Animal Research in the Max Planck Society*, 60pp. Munich, Germany: Max-Planck Gesellschaft. Available at: https://www.mpg.de/10882259/MPG_Whitepaper.pdf (Accessed 15.03.17).

[2] Anon. (2010). *Directive 2010/63/EU* of the European Parliament and of the Council of 22 September 2010 on the protection of animals used for scientific purposes. *Official Journal of the European Union* **L276**, 20.10.2010, 33–79.

[3] Russell, W.M.S. & Burch, R.L. (1959). *The Principles of Humane Experimental Technique*, 238pp. London, UK: Methuen.

[4] Vogt, L., Reichlin, T.S., Nathues, C. & Würbel, H. (2016). Authorization of animal experiments is based on confidence rather than evidence of scientific rigor. *PLoS Biology* **14(12)**, e2000598.

[5] Reichlin, T.S., Vogt, L. & Würbel, H. (2016). The researcher's view of scientific rigor — Survey on the conduct and reporting of *in vivo* research. *PLoS One* **11(12)**, e0165999.

[6] Imboden, M.D. (2011). In *Güterabwägung bei der Bewilligung von Tierversuchen*, pp. 53–57, Zurich, Switzerland: Collegium Helveticum.

[7] Joffe, R.A., Bara, M., Anton, N. & Nobis, N. (2016). Expectations for the methodology and translation of animal research: A survey of the general public, medical students and animal researchers in North America. *ATLA* **44**, 361–381.

[8] Anon. (2017). *Tierversuche verstehen: Eine Informationsinitiative der Wissenschaft*. Available at: https://www.tierversuche-verstehen.de/ (Accessed 23.03.17).